

Application No. 09/818,252
Amendment dated February 1, 2006
Reply to Office Action of November 1, 2005

Please amend the claims as follows:

This listing of claims will replace all prior versions, and listing, of claims in the application:

Applicant has made a good faith effort to list each and every prior claim, including any amendments or changes thereto (or status thereof) in this "Listing" section, however, should there be any discrepancy between the previous version of a claim (or status thereof) and the listing not explicitly amended, canceled or otherwise changed by this amendment, only the previous version (and status thereof) should be referred to as the intent of the Applicant.

Listing of claims:

1. (canceled)
2. (canceled)
3. (canceled)
4. (Currently amended) A system for synchronizing voice signal received via a public switched telephone network (PSTN) and data signal received via a digital subscriber line (DSL), the system comprising:
 - a PSTN interface coupled to transmit and receive the voice signal;
 - a data DSL transceiver coupled to modulate and demodulate the data signal;
 - a synchronization circuit coupled to synchronize said voice signal and said data signal; and
 - a first converter circuit coupled to convert the synchronized voice signal and the synchronized data signal between analog and digital formats; wherein said synchronization circuit synchronizes said voiceband signal with said DSL signal and comprises:
 - a second converter circuit coupled to convert-said voice signal from a

companded format to a linear format;

an upsampler circuit coupled to increase a frequency of said voice signal from $(8 + \delta) \cdot M$ kHz to $(8 + \delta)$ kHz; and

a re-timer circuit coupled to synchronize the upsampled voice signal with said data signal

wherein said synchronization circuit
synchronizes said voice signal with said data signal, and comprises:

a phase offset detection circuit coupled to detect a phase difference between
a PSTN clock associated with said voice signal and a DSL clock associated with said
data signal;

a phase interpolation circuit coupled to adjust said voice signal according to
the detected phase difference; and,

a multiplexer circuit coupled to multiplex said data signal with the adjusted
voice signal for transmission.

5. (currently amended) A system for synchronizing voice signal received via a public switched telephone network (PSTN) and data signal received via a digital subscriber line (DSL), the system comprising:

a PSTN interface coupled to transmit and receive the voice signal;
a data DSL transceiver coupled to modulate and demodulate the data signal;
a synchronization circuit coupled to synchronize said voice signals and said data signal; and

a first converter circuit coupled to convert the synchronized voice signal and the

synchronized data signal between analog and digital formats; wherein said synchronization circuit synchronizes said voice signal with said PSTN signal and comprises:

a re-timer circuit coupled to synchronize upsampled voice signal with a PSTN clock;

a downsampler circuit coupled to reduce a frequency of said upsampled voice signal from $(8 + \delta) \cdot M$ kHz to $(8 + \delta) \cdot M$ kHz $(8 + \delta)$ kHz; and

a second converter circuit coupled to convert the downsampled voice signal from a linear format to a companded format wherein said synchronization circuit synchronizes said voice signal with said data signal, and comprises:

a phase offset detection circuit coupled to detect a phase difference between a PSTN clock associated with said voice signal and a DSL clock associated with said data signal;

a phase interpolation circuit coupled to adjust said voice signal according to the detected phase difference; and

a multiplexer circuit coupled to multiplex said data signal with the adjusted voice signal for transmission.

6. (currently amended) A system for synchronizing voice signal received via a public switched telephone network (PSTN) and data signal received via a digital subscriber line (DSL), the system comprising:

a PSTN interface coupled to transmit and receive the voice signal;

a data DSL transceiver coupled to modulate and demodulate the data signal;

a synchronization circuit coupled to synchronize said voice signal and said

data signal; and

a converter circuit coupled to convert the synchronized voice signal and the synchronized data signal between analog and digital formats ~~The system of claim 1~~, wherein said synchronization circuit synchronizes said voice signal with said data signal, and comprises:

a phase offset detection circuit coupled to detect a phase difference between a PSTN clock associated with said voice signal and a DSL clock associated with said data signal;

a phase interpolation circuit coupled to adjust said voice signal according to the detected phase difference; and

a multiplexer circuit coupled to multiplex said data signal with the adjusted voice signal for transmission.

7. (currently amended) A system for synchronizing voice signal received via a public switched telephone network (PSTN) and data signal received via a digital subscriber line (DSL), the system comprising:

a PSTN interface coupled to transmit and receive the voice signal;

a data DSL transceiver coupled to modulate and demodulate the data signal;

a synchronization circuit coupled to synchronize said voice signal and said data signal; and

a converter circuit coupled to convert the synchronized voice signal and the synchronized data signal between analog and digital formats ~~The system of claim 1~~, wherein said synchronization circuit

synchronizes said voice signal with said data signal and comprises:

a phase offset detection circuit coupled to detect a phase difference between a PSTN clock associated with said voice signal and a DSL clock associated with said data signal;

a demultiplexer circuit coupled to demultiplex said voice signal and said data signal from a received signal; and

a phase interpolation circuit coupled to adjust said voice signal according to the detected phase difference.

8. (canceled)

9. (canceled)

10. (Previously presented) A method of synchronizing a public switched telephone network (PSTN) voice signal and a digital subscriber line (DSL) data signal, the method comprising the steps of:

using a phase offset detector to track a phase offset between a master clock associated with a DSL transceiver at nominally 8 kHz and a PSTN clock at $(8 + \delta)$ kHz;

determining a phase offset between the voice signal and the data signal; and

using the phase offset to re-generate samples passing through a phase interpolation block at new phases corresponding to that of an the PSTN clock

~~shifting one of said voice signal and said data signal according to said phase offset to synchronize said voice signal and said data signal.~~

11. (currently amended) The system of ~~claim 4~~ claim 6 further comprising:
circuitry adapted to combine the voice signal and the data signal.

12. (Previously presented) The system of claim 11 further comprising:
a converter circuit coupled to convert the combined voice and data signals
between analog and digital formats.

13. (new) The system of claim 7 further comprising:
circuitry adapted to combine the voice signal and the data signal.

14. (new) The system of claim 13 further comprising:
a converter circuit coupled to convert the combined voice and data signals
between analog and digital formats.